

ENDANGERED SPECIES: COSTS AND BENEFITS¹

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ABSTRACT.— Biologists are often placed in the difficult position of defending a threatened habitat or animal with vague reasoning and faulty logic, simply because they have no better rationale at their immediate disposal. This places them at a distinct disadvantage and literally at the mercy of resource exploiters and their easily assignable dollar values. Although the initial dollar cost of delaying or precluding "developing" may be significant, the long-term benefits of saving the biological entities which might otherwise be destroyed are likewise great and are measurable in concrete terms which society is only now beginning to appreciate. Case histories are presented, a more profound rationale is explained, and the environmentalist is challenged to make his case sufficiently effective to reverse the current exploitive trends which threaten so many of earth's life forms.

The land and water developers, mineral extractors, and other resource users which burgeoned nationwide (especially in the West) following World War II placed agency resource managers in a new and uncomfortable position. Whereas there once had been sufficient land and water for everyone, including our plant and animal species, we suddenly found ourselves entering into what seemed (on the surface, anyway) an "us or them" situation. Backed into a corner, biologists and administrators found themselves searching frantically for values with which to defend their trust against the hard dollar figures of the exploiter.

Nowhere has this concept been more apparent than in our efforts to preserve threatened and endangered species. When pitted against a potential development project involving the expenditure of millions of dollars, the environmentalist has been forced to bolster his innate sense of doing what he knows is right with whatever biological rationale might enter his mind. Often his reasoning proves biologically unsound, reducing his chances of success and injuring his professional credibility.

A ray of hope has been noted recently through the presentation of a new rationale, one which bolsters valid existing arguments with profound spiritual values. This paper presents a brief history of recent preservation

efforts, summarizes the new rationale, and offers the hope that newly defined goals, although lofty, are by no means unattainable.

ACKNOWLEDGMENTS

It would be ungrateful of me to prepare a paper on endangered species, especially one involving fishes, without acknowledging the enormous efforts of Professor Carl Hubbs of Scripps Institution of Oceanography and Dr. Robert Rush Miller of the University of Michigan. Many others, agency biologist and academician alike, have made great contributions to the cause, especially in recent years. Special thanks are due Dr. David W. Ehrenfeld of Rutgers University, Dr. Hugh W. Nibley of Brigham Young University, and Mr. Jimmie Durham of the International Indian Treaty Organization, whose works I have referred to and quoted extensively in the preparation of this paper.

BACKGROUND

My first real involvement with endangered species began in July 1964 during a field trip with Bob Miller and Carl Hubbs in California's Owens Valley. Bob suspected that the Owens pupfish (*Cyprinodon radiosus*) was extinct when he described it (Miller 1948), but he felt it worthwhile to make one final effort

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to locate a remnant population. My interest in endangered and nongame fishes was minimal at that time; yet, when exultant voices resounded through the marsh, a strange feeling came over me. My conversion to the cause of nongame species was instantaneous and dramatic. Fish Slough on the floor of Owens Valley was my Road to Damascus (Miller and Pister 1971), and I have been an active crusader for the past 14 years, almost to the day.

Sympathy for the cause was rare within my agency, and time and funds were virtually unavailable for anything but the management of game species. What work we were able to accomplish was generally done on our own time and expense.

Yet somehow the movement grew. Support was excellent from the academic community; and the Fish and Wildlife Service, which found itself less encumbered by politics and tradition than those of us in state agencies, also offered good assistance, often to cries of anguish concerning the "Federal Octopus" from within Great Basin state directorships. Sadly, this point of contention still precludes optimum interagency management programming, and we still eagerly await the day when welfare of the resource will overcome agency jurisdiction as the primary point of concern.

The initial meeting of the Desert Fishes Council, formed in desperation in 1969 to stave off the almost certain extinction of several fishes within the Death Valley drainage system, drew 44 individuals, primarily with federal or academic affiliations (Pister 1974). The 1978 Council membership approaches 300 and is growing rapidly as public recognition of the need for desert ecosystem protection increases.

My involvement in endangered species work (and colleagues often state the same motivation) stems from a desire to leave something significant as a mark of my having been here. Somehow, in my advancing career, the idea of providing a bunch of gamefish for people to catch simply was not sufficiently fulfilling. It became apparent to me that if man were ever to exercise his dominion (a term which until recently was disturbingly vague) in an acceptable way, he was

going to have to turn a new leaf and face a new set of problems.

DISCUSSION

At a recent symposium on endangered species held at Yale University, Dr. Lee Talbot, vice-president of the International Union for the Conservation of Nature, said that even obscure endangered species can serve as indicators of large environmental problems that may have major adverse effects on people who could not care less about the animal in question. In this context, let us consider the following examples:

Devils Hole

East of Death Valley, Nevada, is a limestone cavern with a tiny pool containing the entire world population of the Devils Hole pupfish (*Cyprinodon diabolis*). Extensive and indiscriminate agricultural development and irrigation in the late 1960s was rapidly lowering the aquifer system supplying the pool, and it was apparent that, unless someone did something to stop it, a full species (the most highly evolved of the Death Valley cyprinodonts) would soon become extinct. This actually was the *cause célèbre* which motivated us to form the Desert Fishes Council. We fought long and hard in behalf of Devils Hole and its inhabitants and found, in the process, that the State of Nevada, with the exception of its Department of Fish and Game, was often uncooperative and even antagonistic when asked for assistance in stopping the deadly water table drawdown. This seemed particularly true of the state engineer's office. Nevada is very development oriented and, despite a rather paradoxical state endangered species law, generally viewed as highly undesirable a tiny fish of no economic value which seriously threatened a multimillion dollar ranching operation.

Federal law seemed to offer our only salvation in this matter, so in July 1972 the People of the United States, through the Department of Justice, went to court against the land developer and the State of Nevada as codefendants. Interestingly, the case was not argued on the basis of the Endangered Species Act, but on a point of water law.

Initial judgment was favorable, and after a siege in the appellate court the case was heard (amidst the strong desire of western congressmen to reverse the earlier decisions) by the U.S. Supreme Court. In June 1976 the court ruled unanimously in favor of the People of the United States (and the fish), and we began to regain some confidence in "the system." It was encouraging to know that the Equal Justice under Law inscription over the entrance to the Supreme Court building in Washington, D.C., applies to fish, too.

Probing deeper into the matter, we found that the Ash Meadows ranching operation was only a symptom of a much greater environmental threat. A report by a consultant to the Nevada State Engineer (Nevada State Engineer's Office 1971) to locate and evaluate future water sources for Las Vegas earmarked underground supplies around Devils Hole to provide 3 million acre feet over a 30-year period. At this time, the report indicated, it would no longer be feasible to run the pumps, and the deteriorating quality of what remained would make it unsuitable anyway. However, that 3 million acre feet would allow a sufficient increase in population to facilitate acquisition of water from more permanent sources farther away (such as the Columbia or Snake rivers).

In this case the Devils Hole pupfish proved to be an indicator organism which led, eventually, to a discovery of the underlying politics of the entire matter. Would it be to man's long-term benefit to destroy a spring ecosystem unique in the United States and equaled only in one location in Mexico simply to provide short-term water to a city which must very obviously someday curtail its growth? At least we now have the chance to take a harder look.

Tellico Dam and the Snail Darter

In a related situation, news media throughout the United States have recently been discussing a situation on the Little Tennessee River wherein the tiny snail darter (*Percina tanasi*) has essentially stopped completion of the \$116 million Tellico Dam following a 6-3 Supreme Court decision affirming the provisions of the Endangered Species Act of 1973.

Reaction by the media has been mixed, with some lauding the decision and others condemning an action that, in their estimation, would waste \$116 million simply to save a fish of no known economic value. In the wake of this, Congress (with many members in an election year asking themselves "What if Tellico were in *my* district or state?") is now debating whether or not the Endangered Species Act should even be renewed and, if so, what amendments should be made to "allow greater flexibility."

Again, a look behind the scenes is revealing. First off, TVA (the sponsoring agency) failed to discuss the snail darter problem with the Fish and Wildlife Service until the project was nearly finished, and greatly accelerated the construction schedule to create a stronger case for completing the dam. Secondly, a General Accounting Office study (U.S. General Accounting Office 1977) implemented by Congress revealed a cost-benefit analysis so faulty that even after the expenditure of over \$100 million taxpayers would be money ahead if the dam were torn down. In fact, this alternative was offered by TVA Chairman S. David Freeman before a House subcommittee following the Supreme Court decision and release of the General Accounting Office report. Lastly, considering the widespread pressure to terminate or weaken the Endangered Species Act, it is significant to note that in all except one (Tellico) of more than 4,500 consultations between developers and the Fish and Wildlife Service, both the project and the species in question were deemed able to coexist.

Additional Benefits

In addition to the above-listed benefits of revealing the political issues underlying various development proposals, concern over endangered species has resulted in beneficial philosophical shifts within many state fish and wildlife management agencies. Although the primary orientation of such agencies remains one of providing a harvestable product for hunters and anglers, changes are being noted through the implementation of non-game, endangered species, environmental, and land acquisition programs as the future

demands of society become increasingly apparent (Pister 1976).

Costs

What are the direct agency costs of rare and endangered species programs? Small, by most standards. In 1978, according to Fish and Wildlife Service figures, the cost of administering the Endangered Species Act, including aid to the states, was \$16.2 million. A figure of \$19.4 million is estimated for 1979. It is virtually impossible to accurately assess the dollar costs of delaying a development project during the discussion period with the Fish and Wildlife Service.

A NEW RATIONALE

Why do the people of the United States find themselves in the current dilemma? Perhaps Nibley (1978:85-86) says it best: "We have taught our children by precept and example that every living thing exists to be converted into cash, and that whatever would not yield a return should be quickly exterminated to make way for creatures that do." I cannot think of a better way to put it, and I am reminded of Paul's admonition to Timothy nearly 2,000 years ago: "For the love of money is the root of all evil..." (1 Tim. 6:10).

In view of the increasing concern of virtually all segments of society over environmental matters generally, and noting this same concern within academic circles, it appears to me highly appropriate that two of the most outstanding essays involving endangered species to emerge during the past decade should be written by eminent scholars representing two very different disciplines. David W. Ehrenfeld, a Harvard M.D. with a Ph.D. in zoology and biochemistry from the University of Florida, is currently professor of biology at Cook College, Rutgers University. Hugh Nibley graduated in history from UCLA and received his Ph.D. from the University of California at Berkeley. Adept in 14 languages, he taught history and languages at the Claremont Colleges in California before moving to Utah. He is now professor of history and religion at Brigham Young University.

Yet, although their academic disciplines may differ, their philosophies blend marvelously well, complement one another, and lead to a logical and acceptable rationale for the preservation of *all* life forms.

Ehrenfeld (1976), in a masterful essay entitled "The Conservation of Non-Resources," does the biologist a great favor by critically analyzing the most popular (and frequently contrived) reasons advanced in defense of a favorite species or program. He defines a resource as a commodity that has an appreciable money value to man and then lists several that do not. These he considers to be non-resources, without conjectural or demonstrated resource value to man. He utilizes the Houston toad (*Bufo houstonensis*) to exemplify this concept and throws fear into the hearts of many zealots when he states quite accurately that certain species may even exhibit a negative value. Ehrenfeld warns against the dangers of prioritizing, or ranking, species or natural areas in a preservation program because of our categorical lack of knowledge about them, be it now or 100 years from now. He feels, further, that formal ranking sets natural area against natural area (and species against species) in an unacceptable and totally unnecessary way, and emphasizes that the need to conserve a particular community or species must be judged independently of the need to conserve anything else (Ehrenfeld 1976:653).

He then goes on (p.654) to state that only one account exists in Western culture of a conservation effort greater than that now taking place, where not a single species was excluded on the basis of low priority, and by all accounts not a single species was lost (Genesis 7:8-9):

Of clean beasts, and of beasts that are not clean, and of fowls, and of everything that creepeth upon the earth,
There went in two and two unto Noah into the ark,
the male and the female, as God has commanded Noah.

It is encouraging to note that even (or perhaps especially) the more sophisticated writers seem to be rejecting the classical, anthropocentric economic arguments for species preservation in favor of a religious concept presented by Elton (1958) 20 years ago and further developed by Ehrenfeld (1976:654-655), who states:

The non-economic value of communities and species is the simplest of all to state: they should be conserved because they exist and have existed for a long time. Long-standing existence in nature is deemed to carry with it the unimpeachable right to continued existence. Existence is the only criterion of value, and diminution of the number of existing things is the best measure of decrease of value. This is, as mentioned, an ancient way of evaluating "conservability" and by rights ought to be named the "Noah Principle" after the person who was one of the first to put it into practice.

In recent hearings on the Endangered Species Act held by the House Merchant Marine and Fisheries Committee, Jimmie Durham, director of the International Indian Treaty Organization, posed a very logical and pertinent question: Who has the right to destroy a species? Because of Durham's eloquence, any attempt to paraphrase his statements would markedly reduce the feeling which his words convey. The following material has been extracted from his published address (Durham 1978):

In *Ani Yunwiyah*, the language of my people, there is a word for land: *Eloheh*. This same word also means history, culture, and religion. This is because we Cherokees cannot separate our place on the earth from our lives on it, nor from our vision and our meaning as a people. From childhood we are taught that the animals and even the trees and plants that we share a place with are our brothers and sisters.

So when we speak of land, we are not speaking of property, territory or even a piece of ground upon which our houses sit and our crops are grown. We are speaking of something truly sacred.

There is no Cherokee alive who does not remember that Trail of Tears, as we call our march into exile in Oklahoma. There is none among us who does not remember and revere that sacred land, *Echota*.

Today, the Tennessee Valley Authority would like to flood the sacred valley that held our two principal cities, *Echota* and *Tenasi*, after which the state is named. The Tellico project would have destroyed an area of great religious importance, many settlement sites, cemeteries, rich farmlands, forests and the river itself. This is an unneeded dam which can, at the whimsy of TVA, wipe out thousands of years of history of a great and currently oppressed people. To do so would be an insult not only to the Cherokee, but also to all the people in the United States and to humanity. Yes, I am proud enough to state that the history and vision of my people are important to humanity.

The flooding of our valley has been stopped temporarily because of a little fish that lives there and nowhere else. I have seen Atty. Gen. Griffin Bell, the *New York Times* and a national television network make fun of this little fish and I would like to ask why it is considered so humorously insignificant. Because it is little, or because it is a fish?

It is this incredible arrogance towards other life that has caused such destruction in this country. Who is Grif-

fin Bell or the U.S. government to play God and judge the life or death of an entire species of fellow beings which was put here by the same power that put us here? Who has the right to destroy a species of life, and what can assuming that right mean?

Let me be emotional: To me, that fish is not just an abstract "endangered species" although it is that. It is a Cherokee fish and I am its brother. Somehow, it has acted to save my holy land, so I have a strong gratitude for that fish.

The Cherokee people in Tennessee, Oklahoma, the Carolinas, Georgia and wherever we might be are of one voice and of one mind that this dam, this degradation, must be stopped. We want our universe, our *Echota* with all of its fish and all of its life to continue. We are sure that this cannot be against the interests and wishes of the American people.

DEFINITIONS

Although *subdue* and *dominion* as used in Genesis carry a religious connotation, virtually all environmentally oriented discussions in which these words arise seem to end with everyone defining them to suit his own selfish purposes.

We have long been in need of a clear and learned treatise on this subject, and the entire cause of species preservation is fortunate indeed to have someone of Hugh Nibley's stature and capability to provide one for us (Nibley 1978:85-99). His analysis of man's dominion borders on pure genius, and he logically asks in his preface (p.86): "If God were to despise all things beneath him, as we do, where would that leave us?" He then proceeds typically to use a wealth of scripture, classical literature, and other references to develop his theme that "Man's dominion is a call to service, not a license to exterminate" (p.96), and provides an example from a pioneer leader: "while 'subduing the earth' we must be about 'multiplying those organisms of plants and animals God has designed shall dwell upon it,' namely 'all forms of life,' each to multiply in its sphere and element and have joy therein." (p.87). This was indeed an inspired statement from the leader of a group of pioneers seeking to tame a desert wilderness. Nibley suggests an in-depth analysis of the derivation of "dominion," which clearly turns out to be the responsibility of the master for the comfort and well-being of his dependents and guests, "not a predator, a manipulator or an exploiter of other creatures,

but one who cooperates with nature as a diligent husbandman" (p.88).

Nibley continues: "The teaching of Israel laid the heaviest emphasis on responsibility. Since man is quite capable of exercising the awesome powers that have been entrusted to him as the very image of God, he must needs be an example to all, and if he fails in his trust, he can only bring upon himself the condemnation of God and the contempt of all creatures." (pp.89-90).

Nibley's explanation of man's hostility is as logical and obvious as it is painful: "The animal, vegetable, and mineral kingdoms abide the law of their Creator; the whole earth and things pertaining to it, except man, abide the law of their creation, while 'man, who is the offspring of the Gods, will not become subject to the most sensible and self-exalting principles.' (Journal of Discourses, 9:246). With all things going in one direction, men, stubbornly going in the opposite direction, naturally find themselves in the position of one going the wrong way on the freeway during rush hour; the struggle to live becomes a fight *against* nature. Having made himself allergic to almost everything by the Fall, man is given the choice of changing *his* nature so that the animal and vegetable creation will cease to afflict and torment him, or else of waging a truceless war of extermination against all that annoys him until he renders the earth completely uninhabitable." (pp.94-95).

SUMMARY

The obvious benefits of endangered species programs may therefore be summarized as follows:

1. Endangered species generally serve as indicators of larger environmental problems and, when detected, allow analysis and correction of more involved issues during the pursuit of a preservation program.
2. The "Era of Endangered Species" has initiated a process of maturation within state fish and wildlife agencies as they begin to consider *all* species in their program planning, not simply those with an obvious economic value.

3. By preventing the extinction of fish and wildlife species (and *all* life forms), we automatically preserve any anthropocentric values which they may possess, but which research may not yet have discovered.
4. Perhaps the most important reason for preserving endangered species is the realization of the opportunity granted to man—the only species endowed with the capability of truly caring for his fellow creatures—to exercise righteously the dominion granted him by his Creator. Doing so will do much to preserve man's self-respect. The manifestations of this concept can be enormous, including peaceful coexistence with nature, other nations, and himself.

CONCLUSION

Considering our rather dismal record to date, including threatened changes in the Endangered Species Act resulting from the Tellico Dam-snail darter conflict, the cynic would consider it quite improbable that man would ever categorically accept a religious (or morally based) reason for preserving other life forms. At this point I must assume the role of the optimist and state that a widely accepted nonresource rationale is not only desirable, it is absolutely mandatory if we are ever to gain the necessary political strength to assure adequate recognition of the biota in a proposed development project. It seems unlikely in the foreseeable future that, in terms of dollars, we will ever be able to place a higher value on the Devils Hole pupfish than on a section of resort condominiums in Las Vegas, or prove that the snail darter swimming above Tellico Dam has an economic worth in excess of the electricity produced by the water in which it lives.

Ehrenfeld (1976) states quite correctly that if nonresource arguments are ever to carry their deserved weight, cultural attitudes will have to be changed. This is a big order, but we have no alternative but to try. Henry Ford used to remind his plant managers: "You can say it can be done, or you can say it can't be done and be correct either way."

An analysis of Section 2 (Findings, Purposes, and Policy) of the Endangered Species

Act of 1973 indicates that Congress apparently felt it was worth a try to implement such a cultural change, inasmuch as the states (often the hardest to sell in such matters) and other interested parties are encouraged to develop and maintain conservation programs which meet national and international standards as a key to better safeguarding, for the benefit of all citizens, the nation's heritage in fish and wildlife. Further, the purposes of the act include providing a means whereby the ecosystems upon which endangered and threatened species depend may be conserved. Lastly, the policy of Congress is stated that all federal departments and agencies shall utilize their authorities in furtherance of the act. Although the act lists the physical means of achieving its purposes, it fails to address the matter of enlisting and sustaining philosophical support. Inasmuch as the long-term effectiveness of any legislation is dependent upon its acceptance by the people, it is implicit that the major responsibility for assuring this falls upon those of us who feel strongly about such things.

REFLECTION

Not long ago I arose early and went for a walk near my Bishop home. I glanced westward and watched the moon set just as the first rays of the rising sun began to tint the great peaks of the Sierra Nevada crest. The effect was spectacularly beautiful and, to me, illustrated the concept of "the beginning and the end." The beginning was represented by an unprecedented degree of enlightenment within the American public and in our own philosophies, and a renewed ability as agencies and individuals to work together toward the management and preservation of all of the nation's (and world's) life forms; the end by a lessening and ultimate cessation of the anthropocentric attitudes within the public and ourselves which have in so many instances "come home to roost" and caused our current dilemma.

The sun continued to rise and the red turn to gold as my thoughts went back to the early days of our desert fish programs. How utterly hopeless everything seemed then! I uttered a silent prayer that the insight, hard work, and example of the earliest workers in

this field might inspire us to better serve the multitudes who will come after, and that we might provide them with a legacy reflecting not only our scientific competence, but also our practicality and philosophical maturity; and that this in turn would constitute a crossroads in American thought concerning man's dominion over the earth. and recognizing the absolute truth that the glory of God is intelligence, I ended my prayer with a plea that we might utilize our collective intelligence to glorify Him by exercising a truly righteous dominion equally over His entire creation.

It seems fitting to express here the thoughts of the late anthropologist and humanist Loren Eiseley (1962, preface): "I believe in Christ in every man who dies to contribute to a life beyond his life." He continues: "I have been accused of woolly-mindedness for entertaining even hope for man. I can only respond that in the dim morning shadows of humanity, the inarticulate creature who first hesitantly formed the words for pity and love must have received similar guffaws around a fire. Yet some men listened, for the words survive."

And the Devils Hole pupfish and snail darter survive, too. Twenty years ago they wouldn't have had a chance.

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